

CLAIMS

I claim:

1 1. A method for inducing spin excitation within an
2 object in a magnetic resonance imaging system that includes
3 a transmit inductor system, said object having one or more
4 intrinsic relaxation time constants, said method comprising
5 the steps of:

6 (a) providing said transmit inductor system with the
7 ability to generate a plurality of RF transmissions with
8 different spatial characteristics;

9 (b) generating a first RF transmission from said
10 transmit inductor system with first spatial characteristics;
11 and

12 (c) prior to expiration of the longest of said
13 intrinsic relaxation time constants, generating a second RF
14 transmission from said transmit inductor system with second
15 spatial characteristics different from said first spatial
16 characteristics;

17 (d) whereby said spin excitation is induced by the
18 combined effects of said first RF transmission and said
19 second RF transmission.

1 2. The method of claim 1 wherein there is a time gap
2 between said first RF transmission and said second RF
3 transmission.

1 3. The method of claim 1 wherein there is no time gap
2 between said first RF transmission and said second RF
3 transmission.

1 4. The method of claim 1 wherein said first RF
2 transmission is temporally overlapped by said second RF
3 transmission.

1 5. The method of claim 1 wherein said method further
2 comprises generating additional RF transmissions after said
3 second RF transmission.

1 6. The method of claim 1 wherein said transmit
2 inductor system is provided with a volume coil having a
3 primary mode and a gradient mode, said first RF transmission
4 being generated by said volume coil in said primary mode and
5 said second RF transmission being generated by said volume
6 coil in said gradient mode.

1 7. The method of claim 1 wherein said transmit
2 inductor system is provided with a volume coil and at least
3 one surface coil, said first RF transmission being generated
4 by said volume coil and said second RF transmission being
5 generated by said at least one surface coil.

1 8. The method of claim 1 wherein said transmit
2 inductor system includes a plurality of surface coils, each
3 of said RF transmissions being generated by at least one of
4 said surface coils.

1 9. The method of claim 1 wherein said first RF
2 transmission transitions to said second RF transmission by
3 continuously varying said spatial characteristics generated
4 by said transmit inductor system.

1 10. A method for inducing spin excitation within an
2 object in a magnetic resonance imaging system that includes
3 a transmit inductor system, said method comprising the steps
4 of:

5 (a) providing said transmit inductor system with the
6 ability to generate an RF transmission with continuously
7 time-varying spatial characteristics; and

8 (b) generating an RF transmission from said transmit
9 inductor system with spatial characteristics that change as
10 a function of time;

11 (c) whereby said spin excitation is induced by the
12 combined effects of said spatial characteristics that change
13 as a function of time.

1 11. The method of claim 10 wherein said object has one
2 or more intrinsic relaxation time constants and said RF
3 transmission has a duration of not longer than the longest
4 of said intrinsic relaxation time constants.